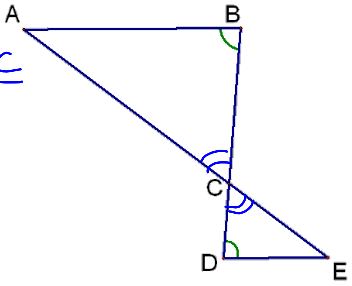
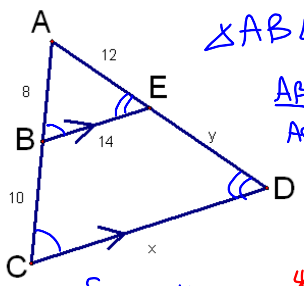
6-4 and 6-5
Prove Triangles Similar by AA~, SSS~, and SAS~

Postulate 22--<u>Angle-Angle (AA~) Similarity Postulate</u>--If 2 angles of 1 triangle are congruent to 2 angles of another triangle, then the 2 triangles are similar.

$\triangle ABC \sim \triangle \underline{EDC}$

AA~





$\triangle ABE \sim \triangle ACD$

$$\frac{AB}{AC} = \frac{BE}{CD} = \frac{AE}{AD}$$

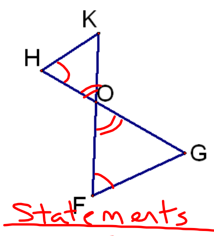
$$\frac{8}{18} = \frac{14}{x}$$

$x = 31.5$

$$\frac{\cancel{8}\,4}{\cancel{18}\,9} = \frac{\cancel{12}\,3}{12+y}$$

$$\frac{1}{9} = \frac{3}{12+y}$$

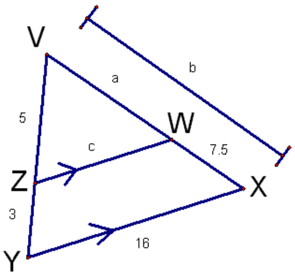
$15 = y$



Given: $\angle H \cong \angle F$

Prove: $HK \cdot GO = FG \cdot KO$

Statements	Reasons
① $\angle H \cong \angle F$	① Given
② $\angle HOK \cong \angle FOG$	② Vert. $\angle$s $\cong$
③ $\triangle HOK \sim \triangle FOG$	③ AA~
④ $\frac{HK}{FG} = \frac{KO}{GO}$	④ Corr. sides of $\sim \triangle$s are proport.
⑤ $HK \cdot GO = FG \cdot KO$	⑤ Cross Mult.

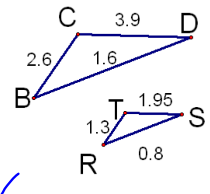


Theorem 6.2--SSS~ Theorem--If the corresponding ~~side~~ lengths of 2 triangles are proportional, then the triangles are similar.

small medium large

$$\frac{1.6}{.8} = \frac{2.6}{1.3} = \frac{3.9}{1.95}$$

$2 = 2 = 2$ ✓



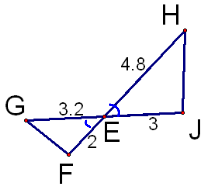
Theorem 6.3--SAS~ Theorem--If an angle of 1 triangle is congruent to an angle of a second triangle, and the lengths of the sides including these angles are proportional, then the triangles are similar.

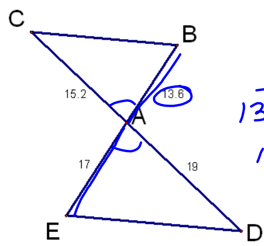
small large

$$\frac{2}{3} \stackrel{?}{=} \frac{3.2}{4.8}$$

$\triangle GEF \sim \triangle HEJ$

SAS~





Are the triangles similar?

$$\frac{17}{13.6} = \frac{19}{15.2}$$

$1.25 = 1.25$

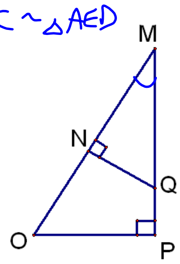
yes SAS~

$\triangle ABC \sim \triangle AED$

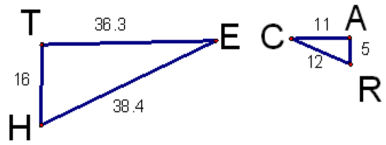
Are the triangles similar?

$\triangle MNQ \sim \triangle MPO$

AA~



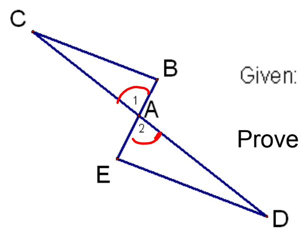
Are the triangles similar?



$\frac{16}{5}$ $\frac{36.3}{11}$ $\frac{38.4}{12}$

$3.2 \neq 3.3$

Not ~



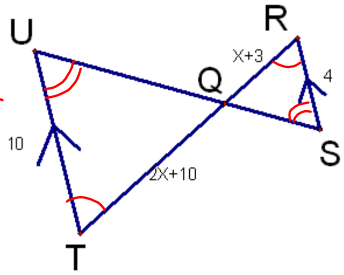
Given: $\frac{AC}{AD} = \frac{BA}{EA}$

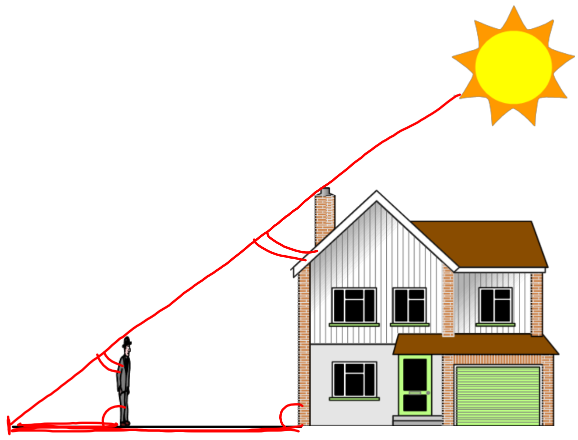
Prove: $\angle C \cong \angle D$

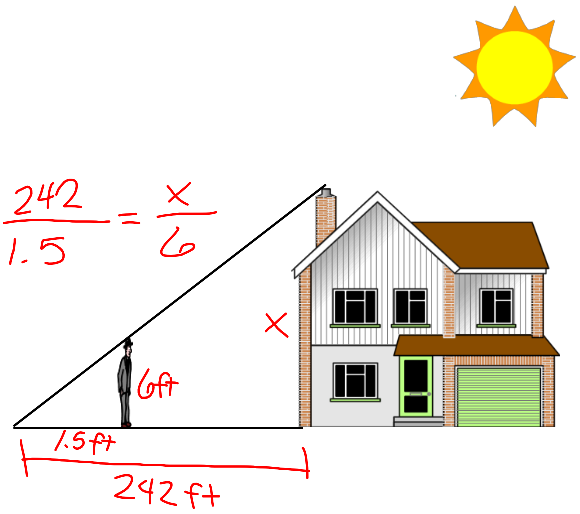
1. $\frac{AC}{AD} = \frac{BA}{EA}$	1. Given
2. $\angle 1 \cong \angle 2$	2. Vert. ∠s ≅
3. △ABC ~ △AED	3. SAS~
4. $\angle C \cong \angle D$	4. Corr ∠s of ~△s are ≅

$\frac{\cancel{10}\,5}{\cancel{4}\,2} = \frac{2x+10}{x+3}$

X = 5

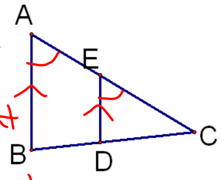






Given: $\overline{DE}$ is the midsegment of ΔABC
Prove: $\Delta CDE \sim \Delta CBA$

S.	R.
① ~~	① Given
② $\overline{DE} \parallel \overline{BA}$	② Midsegment Thm
③ $\angle A \cong \angle DEC$	③ Corr ∠s post.
④ $\angle C \cong \angle C$	④ Refl.
⑤ $\Delta CDE \sim \Delta CBA$	⑤ AA~



$DE = \frac{1}{2} AB$

Midsegment Thm

HW
p384-385 #s 3-17, 21, 22, 25
p392-394 #s 5-8, 33